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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/729,513 | 12/04/2000 | Sanjay K. Yedur | E0802 | 4563 |

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EXAMINER

FERNANDEZ, KALIMAH

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2881

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/729,513

Applicant(s)

YEDUR ET AL.

Examiner

Kalimah Fernandez

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7-14,16-19 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7-14,16-19 and 21-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 1,3-5, 7-12 and 25 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for applying a biasing voltage to the substrate, does not reasonably provide enablement for the limitation "a second voltage to the substrate at a location determined by the scanning probe microscope. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to apply a voltage at a certain location on a substrate determined by the scanning probe microscope, the invention commensurate in scope with these claims. In particular, it is understood that the tip is biased at a first voltage and the substrate biased at a second voltage, however it is unclear how to effectively biases a particular location of the substrate at a second voltage as determined by the scanning probe microscope.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 13-14, 16, 18, 21, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat No 6,197,455 issued to Yedur et al and US Pat No 6,181,097 issued to Li et al.

5. In regards to claims 13-14, Yedur et al teach a method of repairing a defect in a semiconductor substrate (col.1, lines 5-7; col.2, lines 36-39).

6. Yedur et al teach locating the defect by using a STM probe (50) (col.5, lines 24-27).

7. Yedur et al teach mapping the defect location to XY coordinates in a grid map of the semiconductor substrate (col.5, lines 24-25).

8. Yedur et al teach repairing the defect at the location determined by the scanning probe microscope measuring tip (50) and employing the tip (50) as a scribing tip (col.5, lines 27-36).

9. Yedur et al teach the application of a bias voltage to the substrate (col.5, lines 6-8). In addition, Yedur et al teach the application of a bias voltage to the tip (col.5, lines 5-6).

10. Yedur et al does not teach the use of two tips. However, Li et al teach the desirability of plurality of tips for imaging (col.6, lines 32-55) and lithography (col.4, lines 21-57).

11. It would have been obvious to an ordinary artisan to incorporate the teachings of Li et al into Yedur et al since Li et al teach improved efficiency (col.3, lines 10-15).

12. As per claim 16, Yedur et al teach mechanically removal of the defect (col.2, lines 42-45). In addition, Li et al teach the mechanical modification (col.6, lines 10-16).

13. As per claim 18, Li et al teach a diamond tip (col.6, lines 2-3). It would have been obvious to an ordinary artisan to incorporate the teachings of Li et al into Yedur et al since Li teach the common knowledge in the art to use diamond tip for hard surface.

14. As per claim 21, Yedur et al teach the oxidation of a defect (col.6, lines 45-60).

15. As per claim 23, Yedur et al teach the ability to determine the appropriate defect location with another instrument prior to the step of determining the defect's location using SPM/STM (col.6, lines 5-19).

16. As per claim 24, Yeder et al teach the use of a scanning electron microscope, which is typically use to investigate composition of a substrate. Therefore, it is within the brevity of Yeder et al's disclosure to investigate the composition of a substrate, if so desired.

17. It would have been obvious to an ordinary artisan to modify Yeder et al as to conduct composition investigations since the advantage of increase productivity of

18. Claims 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yedur et al and Li et al, and further view of US Pat No 5,866,807 issued to Elings et al.

19. The obvious combination of Yedur et al and Li et al teaches the claimed invention except for forcing the tip against the substrate with a normal force that is at least about ten times greater than the normal force applied to detect the defect.

20. However, Elings teaches the application of a force at least about ten times greater than the normal force (col.2, lines 32-35).

21. It would have been obvious to an ordinary artisan to combine the teachings of obvious combination of Yedur et al and Li et al with Elings et al since Elings et al discloses the ability to both perform indentations and image said indentation (col.5, lines 36-44). Obvious motivation for the combination is the advantage of dual functions as illustrated in Elings et al, col.2, lines 41-44.

22. As per claim 17, Elings et al teach the use of an AFM (col.1, lines 13-18).

23. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yedur et al and Li et al as applied to claim 14 and further view of US Pat No 5,627,815 issued to Koyanagi et al.

24. The obvious combination of Yedur et al and Li et al teaches the claimed invention except for heating the tip.

25. However, Koyanagi et al teach the desirability of heating a tip to enable thermal measurements (see col.5, lines 49-65).

26. It would have been obvious to an ordinary artisan to incorporate the teachings of Koyanagi et al into the obvious combination of Yedur et al and Li et al since Koyanagi et al teach the ability to image the surface during

processing (col.5, lines 63-67). Obvious motivation for the incorporation would be the obvious advantage of minimized error during processing.

Response to Arguments

27. Applicant's arguments with respect to claims 1,3-5,7-14,16-19, and 21-25 have been considered but are moot in view of the new ground(s) of rejection, which were necessitated by applicant's amendment.

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat No 6,366,340 issued to Ishibashi et al and US Pat No 5,666,190 issued to Quate et al are considered relevant to the claimed invention. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final

action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 571-272-2420. The examiner can normally be reached on Mon-Tues 6:30-3:30; Wed-Thurs 8-5 and Fri.9am-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kf


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